21989

<TAFT>NCPSTAT.NLS;1, 19-FEB-74 19:41 EAT3 ;
Network Working Group
Request for Comments # 618
NIC # 21989

Edward Taft
PARC-MAXC

1

A Few Observations on NCP Statistics

2

The NCP in use at HARV-10, CMU-10A, and CMU-10B collects a number of operating and error statistics, which may be typed out on demand by any user by means of the 'IMP ERROR' command, as shown on the sample typescript.

3

The figures shown cover the period since the system was last restarted. They are not logged or recorded in any more permanent form due to extremely limited on-line storage at HARV-10, where the software was implemented. However, due to the small size of the system and infrequent monitor development work, HARV-10 tends to stay up for periods approaching the interval between hardware maintenance, which is one week. The attached output was obtained after 168 hours system uptime.

3a

There are a few things I would like to point out that may be of interest to NCP implementers.

4

First, note that the number of discarded (unexpected) RFNMs is equal to the number of simulated (timed out) RFNMs. This has been the case almost every time I have looked at these statistics. It suggests that the RFNMs are not being lost but are rather delayed beyond the NCP timeout interval, which I believe is 30 seconds.

5

I have heard talk among a few people in the Network community about "lost RFNMs", and would like to suggest this as a possible alternative explanation. Perhaps longer timeouts are in order.

5a

Second, the observed ratio of received allocates to transmitted allocates (on the order of two to one) is also fairly typical. I believe this reflects differences in allocation strategies among various hosts.

6

Many hosts appear to send out an allocate for every data message received. While this is reasonable for connections such as FTP data transfer connections, it imposes considerable extra traffic in the case of the single character messages that seem to be the most common on the network.

6a

Received at NIC 21-FEB-74

The strategy used by the Harvard NCP is to assign a "desired level of allocation" figure to each socket (typically quite small for Telnet connections and large for FTP data connections; it is a user program settable parameter). When the actual allocation for the socket falls below 50% of this level, enough additional allocation is sent to bring it up to the full "desired level". 6b

The effect of this strategy is to significantly reduce the number of allocates returned for a given number of small messages received. This reduces both network traffic and control message overhead at the other end. The strategy has no effect on FTP data messages, since each message is usually large enough to reduce outstanding allocation by at least half at a single blow. 6c

Finally, I should remark on the appallingly large number of NOPs received (typically 25% of all control messages). Most of these seem to be piggy-backed onto other control messages, so the situation is not as awful as the figures would indicate. Nevertheless, I am forced to wonder why anyone would want to send so many. 7

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TELNET typescript file started at THU 31 JAN 74 428:05

#harv-10 (settings loaded) is complete.#

Harvard 5.06A-18 7:28:38
Type 'HELP' if you need it.

.login 62,#
JOB 2 Harvard 5.06A-18 TTY25
Your name please (last name first): Taft
You are logged in as 62,404000
0728    31-Jan-74        Thur
SCHEDULED PM ON THURSDAYS, 0830-1200 EDT

.imp error

NCP version 1573.1604 operating statistics

07:29:02  31-JAN-74
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NCP (link 0) message errors:
  Socket not found: 2184
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  Improper state: 323
  Illegal message type: 2
  Last discarded allocation from PARC-MAXC (XEROX) link 12
  Timed-out exec ICPs: 3

NCP messages:
Type Received  Sent
NOP    81850     0
RTS     3688  2507
STR     2388  3562
CLS     6055  6059
ALL   183050 101442
GVB      772     0
RET        0   772
INS      109     0
ECO     7472 15426
ERP    15065  7472
ERR        2     0
RST     2782   226
RRP      162  2782

Received NCP error messages:
Type Count
 4     2

Most recent error:  type 4 from UCLA-CCN
Data (octal)   4  74   0  10   0   0  74 254   0 200
   (decimal)   4  60   0   8   0   0  60 172   0 128

IMP data message faults:
  Hardware fault: 2
  Link not found: 8
  Discarded RFNMs: 10
  Simulated (timed out) RFNMs: 10

Received IMP messages:
Regular    590812
Err w/o id      3
NOP             4
RFNM       490095
Dest dead     366
Inc trans      52
IMP reset       2

Histogram of received data message sizes
Bits    Count
<1          3
<16    146834
<32     39751
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<64        7044
<128     196983
<256      46099
<512     147609
<1024       534
<2048      1820
<4096      1152
<8192      2979

72 free buffers
7% average buffer utilization

.kjob/k
Job 2, User [62,404000]  Logged off TTY25    0729  31-Jan-74
Runtime 0 Min, 03.29 Sec
```